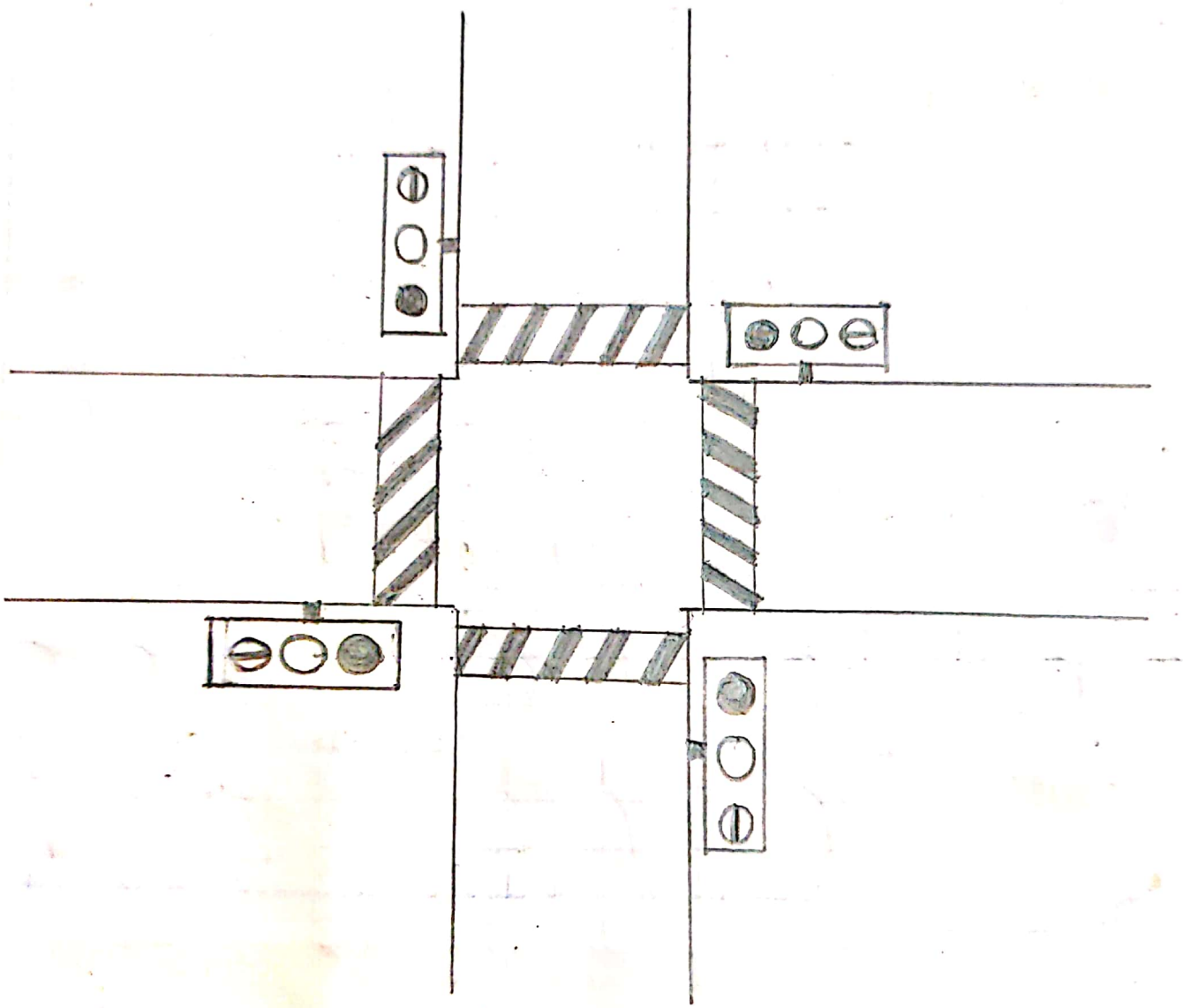
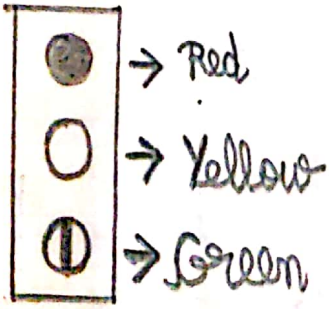
A 4 way junction with traffic signals





A Prototype signal of a 4 way junction using a D-flip flop

Aim: To create a working prototype of a 4 way traffic signal using a D flip flop

Apparatus required:

S.No	Component	Specification	Qty
1	D-flipflop	IC 7474	2
2	NOT Gate	IC 7404	1
3	NAND Gate	IC 7408	1
4	IC trainer kit	—	1
5	Patch chords	—	30

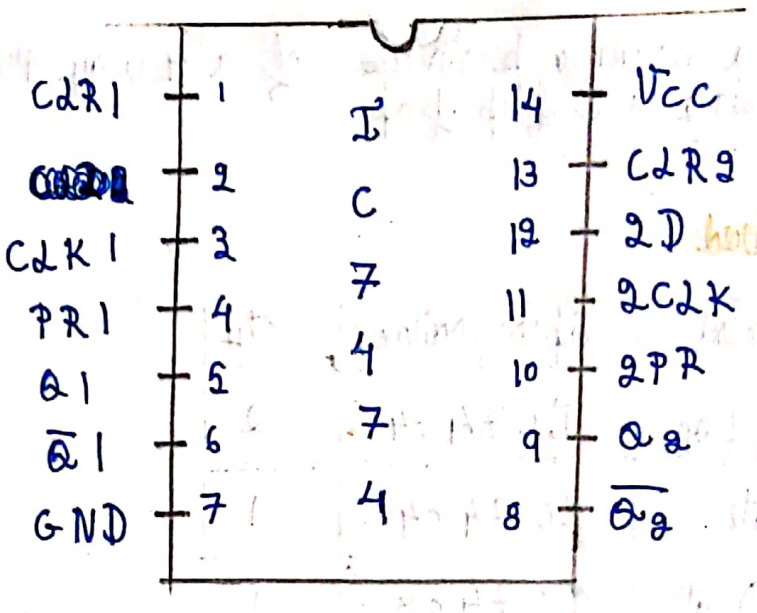
Procedure:

- Assemble and connect the above components in the IC trainer kit
- Give the connections as per the circuit diagram
- Verify the truth table

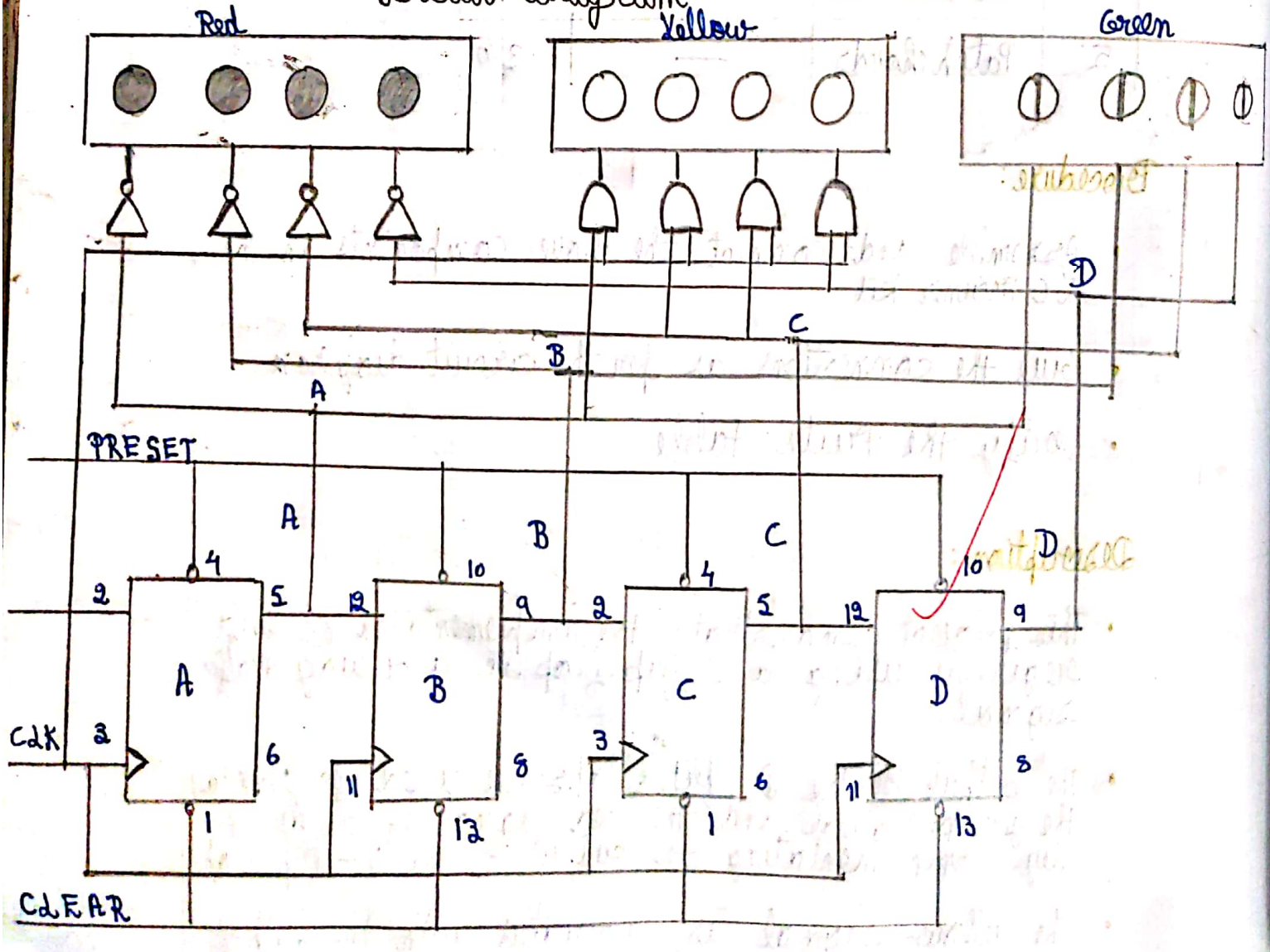
Description:

- This project demonstrates the implementation of shift registers using a D flip flop in a 4 way traffic signal
- The output of the D flip flops are used to generate the green signal and the red signal is obtained by complementating the output of the D-flip flop.
- The yellow signal is generated with the help of the clock pulse and a AND Gate.

Pin diagram



Circuit diagram



- The logical configuration of shift register consist of D-flip flops cascaded with the output of one flip flop connected to the input of the next flip flop
- All the flip flops receive a common clock pulse which causes the shift in the output of the flip flop, i.e, the traffic signal
- The output of a given flip flop is connected to the input of the next flip flop of the register

Truth table

clk	Data	output							
		Red				Green			
		A	B	C	D	A	B	C	D
1	1	0	1	1	1	1	0	0	0
2	0	1	0	1	1	0	1	0	0
3	0	1	1	0	1	0	0	1	0
4	0	1	1	1	0	0	0	0	1
5	0	1	1	1	1	0	0	0	0

When CLK — Explanation

1 ⟶ A is Green & B, C, D are Red

2 ⟶ B is Green & A, C, D are Red

3 ⟶ C is Green & B, C, D are Red

4 ⟶ D is Green & A, C, B are Red

5 ⟶ All the lights are red for the pedestrians to cross